

MOLD PREVENTION PROGRAM

INTRODUCTION

Although not the only source, mold is one potential contributor to a building's indoor air quality and the presence of mold spores may contribute to poor indoor air quality, a condition that is commonly called Sick Building Syndrome. Indoor exposure to mold is often alleged to be the cause of a variety of symptoms and health effects in humans.

A dramatic increase in mold-related claims and their associated settlement costs has been seen across the US during the past few years. These claims have been brought against building owners, building managers, architects, engineers, contractors, construction managers, material suppliers, and manufacturers. This increase in mold-related claims has generated high reward settlements and has led the insurance industry to reduce or eliminate mold coverages for many design and/or construction companies.

To date, no specific regulations for human exposure to mold have been established at a state or federal level, in the US or abroad. However, a few local agencies such as the New York City Department of Public Health have begun to draft guidelines. Therefore not yet a compliance issue, however, the Knight/Jacobs Joint Venture (KJ/JV) is committed to prevention of any potential health effects caused by mold.

To reduce the potential for mold-related claims, KJ/JV has developed this Mold Prevention Program. This program was developed to:

- Direct project management and construction personnel in controlling mold issues during the construction phase of the project.

Mold Policy Statement

KJ/JV shall construct facilities and buildings to current recommended best practices aimed at mitigating mold growth. The health and safety of personnel under the direction of KJ/JV and potentially exposed to mold in their work environment is of strict importance. The health of future occupants of the buildings that we design or construct shall likewise be protected. Current best practices and other innovative techniques will be implemented to eliminate the growth of mold in the work environment, and throughout the life cycle of the facilities that we design, construct or occupy.

Prevention

Mold Prevention

The best defense against mold infestation is systematic prevention, involving construction methods that protect the building components until the envelope is complete.

New Construction

Project personnel will take precautions to control the factors, such as water intrusion and humidity levels that produce mold on materials, equipment, and in the facility or building during construction. The project management team is to establish a Project Mold Protocol that includes, but is not limited to, the following items:

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- Inspection of all building materials delivered to the project for pre-existing water damage as well as existing mold growth.
- Measures to reduce the possibility of water intrusion in the building. Project management will also ensure that subcontractors immediately address any water contamination on installed and in-place equipment and construction materials, such as HVAC, ducts, drywall, cabinetry, and ceiling tile.
- Measures to control the building's humidity levels during construction, and ensuring that the building's HVAC system is operable as soon as possible. The HVAC system must be maintained frequently to reduce the possibility of duct contamination during the construction.
- Under no circumstance may new or additional construction materials be placed over, or otherwise enclose, wet or potentially moldy construction materials.
- If lack of ventilation or moisture build-up is discovered during construction, steps must be taken to ventilate the area promptly. If the moisture issue cannot be resolved, the responsible KJ/JV Construction Engineer/Superintendent shall be notified

Mold Prevention Checklist

Construction Planning

- Provide temporary protection plan for building elements and stored materials.
- Locate a weather-protected, humidity-controlled storage area for material susceptible to water damage and mold growth.
- Where possible, schedule porous building materials to be delivered and installed in dry season.
- Develop plan to protect stucco or other exterior insulation and finish system (EIFS) during installation from rain or excess humidity.
- Review all construction activities that introduce water into the sealed building envelope, such as plumbing flushes, sprinkler testing, and final cleaning, and develop water collection areas and mitigation strategies for mold prevention.
- Use mock-ups to identify possible water intrusion issues for the building/structure construction.

Construction Phase

Received Materials

- Inspect shipping container and material/equipment for damp/wet or moldy conditions.
- If shipping container is damp, wet, or has mold growth, **remove and discard**.
- Reject deliveries of water-damaged materials.
- Require certification at time of delivery that materials are received in good, dry condition.
- If product is damp or wet with **no** mold growth, notify supplier and determine if it can be dried and properly protected.

Stored Materials

- Inspect stored materials regularly for signs of water infiltration or mold growth.
- Store materials/equipment in a weather/water protected area. Elevate stored materials off floors, using pallets or cribbing to prevent accidental water exposure and to ensure air movement under and around materials.
- Cover staged materials to prevent weather/water damage.
- DO NOT install moldy or wet materials. Materials must be dry and free of water staining or mold growth, especially before enclosure in areas where they will be isolated from air movement, such as inside walls.

Construction Sequencing and Protection

- Establish and maintain the building envelope, including proper design and installation of doors, doorjamb, windows, flashings, caulking, waterproofing membranes, and roofing systems.
- Consider using dehumidifiers and/or air dryers to condition the air in the construction zone.
- Do not operate gas-powered machinery inside the enclosed building. These cause elevated humidity levels.
- Do not operate the HVAC system until it has been completed and inspected for water damage or mold growth.
- Consider using fans and air dryers during painting and concrete curing.
- Clean-up water infiltration/puddling immediately.
- Ensure proper over-lapping at architectural reveals, joints, and corners.
- Ensure proper installation and protection of stucco or other EIFS products to avoid moisture's being captured on exterior wall substrates.
- Develop comprehensive temporary protection plan that will protect roof and building envelope during course of construction.
- Develop critical path of installation of building envelope materials to minimize exposure of interior of building to elements.
- Contractor shall perform periodic inspections of site and building envelope to ensure that no water enters building envelope.

Installed Materials Damaged by Water

- Sources of water intrusion or excessive moisture build-up must be mitigated immediately.

- Drywall or Plaster: Remove and replace all water-damaged drywall and insulation within 24 hours. If longer than 24 hours, or mold has already begun to grow, contact a professional remediation firm.
- Ceiling Tiles: Remove and dispose of wet ceiling tiles within 24-48 hours of water damage.
- Hard Surfaces, Concrete, CMU: Scrub water damaged surfaces with a mild detergent followed by a rinse using a solution of ¼ to ½ cup bleach per gallon of water. DO NOT follow with a clear water rinse, as it is desirable for the bleach to remain. Dry thoroughly. *CAUTION: Use bleach in a well-ventilated area and do not mix bleach with ammonia or other cleaning fluids, as hazardous vapors will occur.*
- Metal Surfaces: Scrub surfaces with a mild detergent. Dry thoroughly. Do not use a bleach rinse as bleach may cause corrosion on metal surfaces.
- Carpet and Upholstered Furniture: Carpet and upholstered furniture damaged by steam leaks or potable water should be cleaned, dried and monitored for mold growth or odors. Wet carpet and padding is to be pulled up and dried quickly, if not removed. Carpet and upholstered furniture damaged by floods, sewage, groundwater, or roof leaks should be disposed of immediately.
- Hardwood and Laminate Furniture: If laminate is intact, hardwood and laminate furniture should be cleaned with a solution of ¼ to ½ cup of bleach per one gallon of water, and air-dried. *CAUTION: Bleach may damage or fade colors, therefore test the bleach solution in an inconspicuous area before proceeding.* If laminate has delaminated, dispose of furniture.
- Pressed-wafer board or Particleboard: Dispose of material.
- Files and Papers: Dispose of non-essential wet files and paperwork. The exception would be papers damaged by steam leaks or potable water; these can be dried and monitored for mold growth or odors. Essential wet papers should be removed to a location where they can be dried and photocopied, then discarded. If files or paper cannot be evaluated within 24-48 hours of water damage, files and paperwork may be rinsed with clean water and temporarily frozen until proper drying and evaluation can be completed.
- Photograph water-damaged materials and document proper disposal or cleaning.
- Water-damaged building insulation, including rigid and batting, shall be removed and discarded.

Close-Out Phase

Final Inspection

- Complete *Integrated Building Commissioning procedure*.
- Inspect all visible surfaces for water staining, mold growth, and odors prior to turnover to owner. Document the results of the inspection.
- Replace all air filters throughout system following balancing and prior to owner turnover and occupancy.
- Perform complete air balancing for HVAC and provide documentation to owner or owner's representative.
- Inspect all air handling unit drainage pans to verify that they are clean and draining properly.

Turnover & Owner Operation

- Recommend that client/owner of the building schedule operating and maintenance training for their building maintenance personnel. Offer to help in the future if the client/owner declines.
- Educate the owner on the hazards of molds and fungus, the steps KJ/JV has taken to avoid water damage and mold development, and the responsibilities of the owner's maintenance staff to monitor and prevent water infiltration and mold growth.
- Instruct owner to operate the building so that the indoor air pressure is slightly positive relative to the outdoor air pressure.
- Recommend that owner operate the HVAC at 30 to 60% Relative Humidity.
- Recommend that owner schedule regular, periodic inspections of all enclosed areas that have the potential for accumulation of moisture and that they should repair leaks and/or seepage immediately when discovered.
- Recommend that owner have regular cleaning and maintenance performed on internal HVAC components, and regularly replace all air filters.

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- Recommend that owner avoid cooling the interior space below the mean monthly outdoor dew point temperature.
- Recommend that owner not allow occupants of the building to use personal humidifiers or dehumidifiers to adjust individual comfort levels.